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2012 TSU Undergraduate Research Program

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2012 Summer Undergraduate Research Program



TEXAS SOUTHERN UNIVERSITY

Excellence in Achievement

Texas Southern University **2012 Undergraduate Research Program**

**A MENTORED RESEARCH PROGRAM
SPONSORED BY THE OFFICE OF RESEARCH**

June 4– August 10, 2012



Research activities for science, health, and technology majors will include hands-on basic research, laboratory technique, enrichment activities and field work as prescribed by the faculty and approved by the Office of Research.

Research activities for students in the humanities, education, business, pre-law, social & behavioral science include formulating qualitative and mixed-methods research questions, training in research methods, and hands-on experience towards the creation and use of such discipline-specific research tools as surveys, bibliographies, indices, and data series.

Final Program

Poster Presentations: August 9, 2012 in the New Science Building Foyer.

Selected Oral Presentations: August 10, 2012 in MLK Auditorium, Room 104

2012 UNDERGRADUATE RESEARCH PROGRAM (URP) FELLOWS

NAME	MAJOR	TITLE	MENTOR
Fallon Crane	Art	Basic Research in the Documentation of Texas Southern University's Permanent Art Collection	Dr. Alvia Wardlaw/ Ms. Maya Watson
Rita Ann Reyes	Art	Texas Southern University African Art Growth Collection and Urgency to Catalogue	Dr. Alvia Wardlaw
Jordon E. Williams	Psychology	Academic Performance: Congruence Between Selected Major and Self-Directed Search Score	Dr. Candy Ratliff
Kingsley Onyeiwu	Art	Texas Southern University Alumni Permanent Art Collection	Dr. Sarah Trotty
Nathaniel Harris III	Education	Preparing Tomorrow's Leaders Today: The Role of Educators in Preserving the Academic Excellence of Students Labeled Gifted and Talented	Dr. Candy Ratliff
Da'Quallon Smith	Psychology	The Effect of Negative Stereotypes on Test performance Among U.S. Black Population	Dr. Arthur Whaley
Latosha Guillory	Social Work	Social-Emotional Wellness Programs in Harris County School Districts	Dr. Lauri Address
Brandi Davis	Political Science	The Black Experience: Political Attitudes of Black Caribbean Immigrants and Native-Born African Americans	Dr. Maurice Mangum
Reginald Grant	Political Science	Explaining Support for Affirmative Action and Preferential Hiring and Promotion	Dr. Maurice Mangum
Kayla Burrell	Biology	Identification and Characterization of Genes TSPAN13 and EMP2 in an Aggressive Compared to Less Aggressive Breast Cancer Sample	Dr. Audrey Player
Tim U. Oguamanam	Biology	Identification and Characterization of Two Genes, XIST and STOM, in Aggressive Compares to less Aggressive Breast Cancer Sample	Dr. Audrey Player
Mariam Nakyobe	Engineering Tech.	On Solutions of a Set of Second Order Maxilinear Difference Equations	Dr. Robert Nehs
Amber King	Chemistry	Rearrangement of Esters of 2-Naphtol	Dr. John Sapp
Jenaye Robinson	Biology	Effects of Hydrogen Sulfide-Releasing Compounds on Aqueous Humor Outflow in Porcine Eyes	Dr. Ya Fatou Njie-Mbye and Dr. Sunny E. Ohia
Jere Hickman-Rider	Health Science	Time to Market for Health Sciences Majors	Dr. Jean Hampton and Dr. Monica Rasmus
Anh Vu	Pharmacy	Frequency of Inpatient Withdrawal of Mycophenolatemofetil vs. Tacrolimus After Liver Transplant"	Dr. Joshua Swan
Tram Vo	Pharmacy	Incidence of Gram—Positive Pathogens in the Early Versus Late Period After Orthotopic Liver Transplant	Dr. Joshua Swan
Andrea Braddy	Mathematics	On the Dynamics of Asymmetric Tent Maps	Dr. Willie Taylor
Lan Bui	Pharmacy	Incidence of Adverse Events from Chlorhexidine Bathing in the Surgical Intensive Care Unit: Preliminary Results from a Prospective Randomized Controlled Trial	Dr. Joshua Swan
Nourhane Badawi	Pharmacy	Preliminary Results of a Randomized Controlled Trial Comparing the Incidence of Nosocomial Infections with Chlorhexicine Bathing in the Surgical Intensive Care Unit	Dr. Joshua Swan
Osita Okafor	Pharmacy	Oral Suspensions for Lansoprazole and Tacrolimus	Dr. Rodney Hunter
Jerrold Paul Logue	Pharmacy	The Effect of Chronic Modulation of Protein Kinase A by Dibutyryl cAMP on Gene/protein Expression in Rat Cortical Astrocytes	Dr. Amruthesh Shivachar
Kruti Shah	Pharmacy	The Effect of Chronic Treatment With Synthetic Cannabinoid analog, WIN 55212-2, on Gene/protein Expressions in Rat Cortical Astrocytes	Dr. Amruthesh Shivachar
Ahouti Avi	Pharmacy	Effect of PPAR γ Deletion in Renal Epithelium on Kidney Function	Dr. Weiman He and Dr. Adebayo Oyekan
Damon Hall	Maritime Transportation	Port of Houston: A Development Strategy for Recreation Business Development and Resource Utilization	Dr. Maria Burns
Sarah Glenn	Biology	The Growth Response of <i>Saccharomyces Cerevisiae</i> to Constant Temperature Increase	Dr. Ayodotum Sodipe
Chastity Green	Biology	DNA Accumulation in the Mouse Heart Genome	Dr. Hector Miranda, Jr.
Aketra Bowens	English/ Journalism	George "Bud" Johnson: The Old African Warrior	Dr. Michael Berryhill
Marcus Patterson	Psychology	A Profile of Credit Card Practices Among Black College Students: Socialization and Mental Health	Dr. Mxolisi Siwatu
Jeffery Thomas	Business	Management and Leadership Regarding the United States Military –TSU	Dr. Lucy Ojode

Closing Ceremony for the
2012 UNDERGRADUATE RESEARCH PROGRAM (URP)

OFFICE OF RESEARCH

AUGUST 10, 2012 – 10:00 A.M.

Opening Remarks

Dr. Sunny E. Ohia

Provost, Vice President for Academic Affairs, Vice President for Research

Student and Mentor Recognition

Dr. David Owerbach

Proposal Development Officer

Oral Presentations

1. **Rita Ann Reyes with Research Mentors Dr. Alvia Wardlaw and Ms. Maya Watson:** *"Texas Southern University African Art Collection: Growth and Urgency to Catalogue."*
2. **Kruti Shah with Research Mentor Dr. Amruthesh C. Shivachar:** *"The Effect of Chronic Treatment with Synthetic Cannabinoid Analog, WIN 55212-2, on Gene/Protein Expressions in Rat Cortical Astrocytes."*
3. **Jere Hickman-Rider with Research Mentors Dr. Jean Hampton and Dr. Monica Rasmus:** *"Time to Market for Health Sciences Majors."*
4. **Jenaye Robinson with Research Mentors Dr. Sunny E. Ohia and Dr. Ya Fatou Njie-Mbye:** *"Effects of Hydrogen Sulfide-Releasing Compounds on Aqueous Humor Outflow in Porcine Eyes."*
5. **Latosha Guillory with Research Mentor Dr. Lauri Andress:** *"Social Emotional Wellness Programs in Harris County School Districts."*
6. **Ahouti Avi with Research Mentors Dr. Adebayo Oyekan and Dr. Weiman He:** *"Effect of PPAR γ Deletion in Renal Epithelium on Kidney Function."*
7. **Brandi Davis with Research Mentor Dr. Maurice Mangum:** *"The Black Experience: Political Attitudes of Black Caribbean Immigrants and Native-Born African Americans."*
8. **Lan Bui with Research Mentor Dr. Joshua Swan:** *"Incidence of Nosocomial Infections and Adverse Event from Chlorhexidine Bathing in the Surgical Intensive Care Unit: Preliminary Result from a Prospective Randomized Control Trial."*

Basic Research in the Documentation of the TSU Permanent Collection of Art

Fallon Crane

Research Mentors: Dr. Alvia Wardlaw and Ms. Maya Watson

The importance of documentation is to cover all aspects of an artist works. The forms used in this process are called condition reports which cover: works on paper, sculpture, and paintings. Failure to properly enter information on the artist could lead to misleading or false information. Methods used in reports form consist of: artist name, title, weight, height, medium, and file number. In addition a digital cameratech will be used for capturing each artist piece. Objects are closely examined for signs of wear from setting over a period of time. Findings during research reported a total of two hundred and eighty eight objects. Which were examined and tagged with matching catalog file number and accession number which are given by Texas Southern University art museum proprietor. There were two hundred, and seventy nine painting in all, nine of those paintings were large murals. The remaining pieces were works on paper and prints. Documenting gives researchers an understanding of the era in time which pieces were produced. Also why that medium was used, including details of the dimensions and theme. Learning this process maybe very time consuming, and extra research must be done on artist by using different tools such as: internet browsing, locating artist alumni portfolio or direct contact by phone or e-mail. Here are some forms that may be used in making the process quicker: insuring the artist applies a detailed short form upon production piece. Past Prefect data base will hold images and detailed information on artist

Texas Southern University African Art Collection: Growth and Urgency to Catalogue

Rita Ann Reyes

Research Mentors: Dr. Alvia Wardlaw and Ms. Maya Watson

Having Dr. John T. Biggers establishing the Art Department in 1946, his primary goal was to develop a collection of traditional African Art for the university. Since the 1970s to 2012 the overflow of African Art has grown to the count of over 1,000 works and adding. The urgency to catalogue these historical artifacts has become a necessity to its growth, as the collection makes for great studies in the research of African Art. This collection deserves the same devotion and nobility as other collections of the University has. The collection contains works from wood figure carvings, sticks, drums, masks, stools, items of clothing and ritual objects. Works from geographical regions such as West Africa, Central Africa, and East Africa are all included. In coordination with TSU's undergraduate research program, the opportunity to engage in proper research and furthering the steps of cataloguing the collection are made possible. From data inquiry, conditioning reports, and registration reports, all were involved in cataloguing. Upon completion of the program, 125 works were added to the catalog bringing progress to the exposure of these works. The primary focus of cataloguing and research is properly making history of the provenance as it is becoming apart of TSU's growing collection. Although the entire collection was not completely categorized, still this research gives an effort to further the study, understanding of the arts, appreciation, and has enabled the process of cataloguing advancements in the future.

Academic Performance: Congruence Between Selected Major and Self-directed Search Score

Jordon E. Williams

Research Mentor: Dr. Candy Ratliff

Discovering one's purpose in life is usually the centermost part of one's formative years. This study examined congruence between selected major and Self-Directed Search score on student academic performance. Thirty students between the ages of 18 and 54 attending a Historically Black University in the Southern region of the United States volunteered for this study. Results from Logistic Regression revealed that Behavioral Science majors have an 11% increased likelihood of earning "B" or better than a non-Behavioral Science Major. In addition, students who score high on the Social Scale of the SDS and select a Behavioral Science major will have 216% increased likelihood of earning a grade of "B" or better.

Texas Southern University Alumni Permanent Art Collection

Kingsley Onyeiwu

Research Mentor: Dr. Sarah Trotty and Ms. Maya Watson

We should care about the issue of properly archiving our permanent art collection because they have been entrusted to us by our alumni and in turn we should pay them the respect and attention of preserving their works. The problem is that we tend to neglect and underestimate what we own in our campus, and to the students and members of the humanities it is plainly preposterous. This problem was solved by the simple but elaborate means of archiving. I had the privilege of handling Texas Southern University's first set of Alumni works of art from the 1970s. The first leg of the project was to archive the seniors' notebooks. The notebooks were integrated with students' journal, portfolio of works, philosophy, biography and artist statement; It remains a historical artifact for the university. The second leg of the project dealt with getting a hands-on training on logistics incorporated with the current exhibition at the university museum. The third and final leg included "staging" the works of the seniors to be photographed by the department's archivist. The logistics aspect of the research proved effective as we were successful in collecting and storing properly the university's permanent art collection. This research was the major steps into what will evoke the need of proper cater for the present art collection as well as future collections to arrive.

Preparing Tomorrow's Leaders Today: The Role of Educators in Preserving the Academic Excellence of Students Labeled Gifted and Talented

Nathaniel Harris III

Research Mentor: Dr. Candy Ratliff

The role of educators in preserving the academic excellence of students labeled gifted and talented should be understood. This research sought to answer the following question: Should general education teachers be required to receive training on the nature/ needs of gifted students? This investigation was approached in hopes of finding educators perceptions on extending the state mandated professional development to general education teachers. A review of related literature shows that there are myths and stereotypes regarding gifted and talented students and subscribing to them influences teacher-student interaction. A demographic data form designed to access the background information and opinion of respondents would have been administered. However, due to the small class sizes, the investigator was unable to acquire a representative sample. The investigator predicts that results will show educators in favor of extending mandated professional development to general education teachers.

The Effect of Negative Stereotypes on Test Performance Among U.S. Black Population

Da'Quallon Smith

Research Mentor: Dr. Arthur Whaley

There has been a large amount literature on stereotype threat theory within the past couple of decades. Stereotype threat theory suggests that black students underperform as result of worries or concerns about confirming a negative stereotype about intellectual ability among African Americans. While the theory has received substantial attention, the inconsistencies in demonstrating the effect in college labs versus real-world high stakes testing situations have contributed to criticism. Most noticeably is that a majority of the studies are based on experiments with college students in laboratory settings. Thus there is a question of the external validity of Stereotype Threat Theory, whether the research findings can be generalized outside of the college population into the larger black community. Using the National Survey of American Life, this study examined the generalizability and possible implication of stereotypes on cognitive test performance in the African American population. The findings did not support stereotype threat theory. Implications for addressing the Black-White achievement gap are discussed.

Social Emotional Wellness Programs in Harris County School Districts

Latosha Guillory

Research Mentor: Dr. Lauri Andress

Texas state-wide school discipline focuses on responding to specific student misbehavior by implementing punishment-based strategies including reprimands, office referrals, suspensions, and expulsions. During the 2009-10 school years, the Texas Education Agency (TEA) reported over 2.4 million disciplinary actions for the total statewide student population of almost 5 million. However, national research shows that the implementation of punishment, especially when used inconsistently and in the absence of other positive strategies, is ineffective as a deterrent and fails to support the social and emotional development of youth. The purpose of this research is to analyze the implementation and use of positive strategies in the form of public policy intervention that aims to address the social and emotional wellness needs of adolescents in Harris County. The study focuses on twenty-six school districts in Harris County and incorporates policies identified by The Texas Health Institute (THI) as critical to student well being. Its methodology features key word search of Harris County school district websites, supported by key informant telephone interviews and email responses from policy advocates of regional mental health and education organizations. Our findings demonstrate that all school districts in Harris County incorporate policies on bullying and suicide prevention as a result of bills passed in the 82nd Session of the Texas Legislature. Fewer school districts (62 percent) address teen dating violence using policy language that provides a definition of teen violence and measures that call for contacting parents first before providing services to the students. Last, no school districts are using School-wide positive behavior intervention and support (SW-PBIS) which would stress the use of strategies and systems to assist schools in decreasing problem behavior, increase academic performance, increase safety, and establish positive school cultures. SW-PBIS is a proactive, evidence-based alternative to the traditional punitive, reactive approach to discipline. This study highlights policy efforts to address disciplinary issues in schools by focusing on the social and emotional wellness needs of students that relate to bullying, suicide prevention, teen dating violence and the formation of a school wide overarching framework to guide efforts to address social and emotional wellness.

The Black Experience: Political Attitudes of Black Caribbean Immigrants and Native-born African Americans

Brandi Davis

Research Mentor: Dr. Maurice Mangum

This research project is designed to compare and contrast the political attitudes of African Americans born in the United States from those American Immigrants of African descent born in the Caribbean. The idea for this study is primarily an original and fundamental research idea for it has not been immensely documented thus far. The goal for this project is that we show that there is a correlation between the time one spends in the United States and their view of government and public policy. This is focused solely on those individuals in America of African descent and those who are from Caribbean islands. I suspect that those individuals that immigrate to the United States of America from the Caribbean's perspective of American government and policy will be very different from those American born African Americans. I also suspect that the gap in opinions and perspectives will become smaller or similar in thought as the Caribbean immigrants spend more time in America. This thesis is founded on the cultural differences of each group as well as the minority and immigrant experience and what it is to be labeled "BLACK" in America. Using pre-existing data in the 2004 National Politics Study, I create crosstabs of opinions according to the respondents' racial group as African American or various groupings of Caribbeans. The research were focused on the topics of *racial identity, racial consciousness, group conflict, American identity, patriotism, values, and civil liberties, psychological involvement, and race and gender policies*. The findings showed that there is a distinct difference in the ideals Caribbeans and African Americans, but as Caribbean immigrants are in the United States (generations), their ideals become closer to that of African Americans.

Explaining Support for Affirmative Action and Preferential Hiring and Promotion

Reginald Grant

Research Mentor: Dr. Maurice Mangum

In this paper, we seek to explain why some Americans support affirmative action while others do not and why some Americans favor preferential hiring and promotion and others oppose them, not to make a case for or against affirmative action. Unlike most studies that examine just opinions by whites, we explore the determinants of opinions by whites, African Americans, Hispanics, and Asians. Using the 2004 National Politics Study, we test three theories: reverse/racial discrimination, racial resentment, and realistic group conflict. Analyzing the data with ordered logit, we discover that each theory receives some support, more some than others. We also find that certain theories are more applicable than others depending on the race. That is, while all races base their support or opposition on group or race interests, some factors mean more to some races more than others.

Identification and Characterization of Genes TSPAN13 and EMP2 in an Aggressive Compared to Less Aggressive Breast Cancer Sample

Kayla Burrell

Research Mentor: Dr. Audrey Player

Triple negative breast (TN) cancer is a very aggressive breast cancer with low survival rates and poor patient outcome. Triple negative breast cancer is known to be negative for three genes, estrogen (ER), progesterone negative (PR) and erbB2 erythroblastic leukemia viral oncogene homolog 2 (ERBB2). Our goal is to characterize TN and identify reliable genes that show a difference between aggressive and less aggressive tumors so genes can be used to treat patients and ultimately effect patient survival. A list of more than 56,000 genes was obtained from microarray experiments using cell lines. Genes that were differentially expressed were identified using the T-test and p-values with a statistical cut off <0.05 were selected. To identify genes that were in patient samples, Gene Expression Omnibus (GEO) was searched for genes common to cell lines and patients. The list was decreased to 49. These 49 genes were further filtered using p value cutoff of <0.01 , resulting in a final short list of 16. Genes were visualized using Hierarchical clustering analysis. Two of 16 genes, EMP2 and TSPAN13, were chosen for validation by polymerase chain reaction (PCR) using a patient sample representing primary (less aggressive) and metastatic (more aggressive) tumor. EMP2 and TSPAN13 showed no differential expression between aggressive and less aggressive for particular patient sample selected. The sample chosen for analysis was not consistent with cell line or patient data; a different sample could result in different result.

Identification and Characterization of 2 Genes XIST and STOM in Aggressive Compared to Less Aggressive Breast Cancer Sample

Tim U. Oguamanam

Research Mentor Dr. Audrey Player

Triple negative (TN) breast cancers are negative for 3 genes, estrogen receptor, progesterone receptor and ERBB2 genes. They are classified as basal-like subtype, but although they are similar to basal-like tumors, they are somewhat different on the molecular level. Overall, both are related to aggressive, high risk of metastatic behavior in patients, however, neither basal-like or TN are well defined on a molecular level. In this study, we will identify and characterize the transcriptome of TN cell lines. The approach is to perform various computer-based analyses to compare aggressive versus less aggressive types of samples. We identify two genes XIST (X-inactive specific transcript) a non-coding RNA and STOM (Stomatin transcript variant 1) as differentially expressed in TN (aggressive) compared to other types of breast cancer (representing less aggressive). As validation of the results obtained by computer analyses, we perform polymerase chain reaction (PCR) analysis to examine gene expression in a patient sample representing less aggressive (i.e., primary tumor) compared to the aggressive (i.e., metastases) phenotype.

On Solutions of a Set of Second Order Maxilinear Difference Equations

Mariam Nakyobe

Research Mentor: Dr. Robert Nehs

Our work investigates solutions of some (or all) of the certain second order maxilinear difference equations.

$$x_{n+1} = A - \max\{x_n, x_{n-1}\}$$

All solutions are eventual 3 cycles.

$$x_{n+1} = A + \max\{x_n, x_{n-1}\}$$

For $A > 0$, then $x_n \rightarrow \infty$

For $A < 0$, then $x_n \rightarrow -\infty$

For $A = 0$, then $\{x_n\} = \{\gamma\}$, where $\gamma = \max\{x_n, x_{n-1}\}$

$$x_{n+1} = x_n - \max\{x_n, x_{n-1}\}$$

All solutions are eventually 0.

$$x_{n+1} = x_n + \max\{x_n, x_{n-1}\}$$

If $0 < \beta$ or $\beta \leq 0$ with $\alpha + \beta > 0$, then $x_n \rightarrow \infty$

If $\beta < 0$ and $\alpha + \beta < 0$, then $x_n \rightarrow -\infty$

If $\beta \leq 0$ and $\alpha + \beta = 0$ or $\beta = 0$ and $\alpha < 0$, the $\{x_n\}$ is eventually 0.

$$x_{n+1} = x_{n-1} - \max\{x_n, x_{n-1}\}$$

If $\beta < 0$ and $\alpha = \varphi\beta$, where $\varphi = \frac{1+\sqrt{5}}{2}$, then $\{x_n\}$ converges upward to 0.

In all other cases, the sequence is an eventual 2 cycle of the form $\{0, C\}$ where C can be 0.

$\{x_n\}$ ends in a string of 0's where $0 \leq \beta \leq \alpha$

$$x_{n+1} = x_{n-1} + \max\{x_n, x_{n-1}\}$$

If $0 < \alpha, \beta$ or $\beta = 0 < \alpha$ or $\alpha = 0 < \beta$ or $\alpha \leq 0 < \beta$ or $\beta \leq 0 < \alpha$, then $x_n \rightarrow \infty$

If $\beta \leq 0 = \alpha$ or $\alpha \leq 0 = \beta$, then $\{x_n\}$ is the 2 cycle $\{\alpha, \beta\}$

If $\alpha, \beta < 0$, then $x_n \rightarrow -\infty$

Rearrangement of Esters of 2-Naphthol

Amber King

Research Mentor: Dr. John Sapp

Trifluoroacetic acid (TFA) is a Lewis Acid that has not been used in the Fries Reaction. The objective of this research was to determine the feasibility of using TFA to cause rearrangement of the acetate ester of 2-Naphthol to the ortho hydroxyketone. Infrared Spectroscopy was used to prove that the rearrangement did occur using TFA as the Lewis Acid. In the Infrared range of the Electromagnetic Spectrum, the hydroxyl functional group absorbs energy at approximately 3400cm^{-1} . After reacting 2-Naphthol with acetic anhydride to form the acetate ester and subsequently taking the Infrared spectrum of the solid product, no absorption at 3429.1cm^{-1} was observed. This would indicate that there was no hydroxyl functional group on the molecule. Upon refluxing the acetate ester in TFA for a specified time purifying it and taking an Infrared Spectrum of the product, a strong absorption was observed at 3261cm^{-1} . This proves the reappearance of the hydroxyl group and an indication that rearrangement has occurred.

Effects of Hydrogen Sulfide-Releasing Compounds on Aqueous Humor Outflow in Porcine Eyes

Jenaye Robinson

Research Mentors: Dr. Ya Fatou Njie-Mbye and Dr. Sunny E. Ohia

Evidence from our lab demonstrates that hydrogen sulfide (H_2S) (using H_2S -releasing compounds as donors) can produce pharmacological effects in ocular tissues. Furthermore, other studies report that H_2S can reduce intraocular pressure (IOP). To study the effects of H_2S -releasing compounds on aqueous humor (AH) outflow facility in porcine trabecular meshwork (TM) tissues. Porcine ocular anterior segment explants containing only the TM were perfused with Dulbecco's modified Eagles medium (DMEM) (maintained at 37°C and $5\%\text{CO}_2$) at a constant pressure of 7.35 mmHg. Once the AH outflow was stable, H_2S -releasing compounds; sodium hydrosulfide (NaHS, 1 nM, 100 nM), and L-cysteine (100 nM) were administered, and outflow facility was monitored for 4 hours. Vehicle (0.1% saline) was run in parallel. NaHS (1 nM), a fast-releasing H_2S compound increased AH outflow by 38% for only 1 hour when compared to vehicle. Furthermore, there was a concentration-dependent increase in AH outflow with administration of 1 nM and 100 nM of NaHS. L-cysteine (100 nM), a slow-releasing H_2S compound caused a significant ($p < 0.01$) increase in outflow facility. Interestingly, the duration of the effects of L-cysteine on AH outflow lasted longer than that of NaHS. We show for the first time, that H_2S -releasing compounds can increase AH outflow in porcine TM. Taken together, our results suggest that H_2S could play a significant role in the regulation of IOP.

Time to Market for Health Sciences Majors

Jere Hickman-Rider

Research Mentors: Dr. Jean Hampton and Dr. Monica Rasmus

This research focused on graduation rates of Health Sciences majors in three disciplines of the Health Sciences department: Environmental Health (EH), Health Administration (HA), and Respiratory Therapy (RT). Graduation rates from time of professional program entry to graduation were calculated. Each degree plan from these three Health Sciences majors has a professional program phase which is inclusive of application submission and approval. The professional phase of each discipline, EH, HA and RT, has two years of course work to fulfill degree requirements for graduation. Objectives of the study are to determine the graduation rate of the Department of Health Sciences, to determine the graduation rates of EH, HA, and RT students from professional phase of program to graduation and to compare the graduation rates of EH, HA, and RT students to Texas Southern University graduation rate. This research project used a retrospective analysis to study and calculate the Department of Health Sciences graduation data from 2005-2011. Frequency distributions were calculated in tabular and graphic format. The Office of the Institutional Effectiveness data suggests that 87.5% of Health Sciences graduates from 2005-2011 graduated in 2 years or less from the 2 year respective professional EH, HA and RT programs.

Frequency of Inpatient Withdrawal of Mycophenolatemofetil Versus Tacrolimus After Liver Transplant

Anh Vu

Research Mentor: Dr. Joshua Swan

Immunosuppressive therapy (IST) is used for liver transplant patients to prevent allograft rejection. Post-transplant patients taking IST are at increased risk of developing infections. During severe infectious complications, temporary withdrawal of IST may be necessary to prevent infectious related morbidity and mortality. Several retrospective studies have shown that immunosuppressant withdrawal may be used in the management of severe infections. The objective of this study is to determine the withdrawal frequency between MMF and TAC during hospitalization after OLT. A retrospective cohort study was conducted to compare the rates of withdrawal from two commonly used IST medications: mycophenolatemofetil (MMF) and tacrolimus (TAC) in all patients who received an orthotopic liver transplant (OLT) at The Methodist Hospital from 04/01/2008 to 06/25/2012. The withdrawal of steroids and MMF was defined as no dose given for more than 72 hours. Additionally, the withdrawal of TAC was defined as no dose given for more than 72 hours with FK level less than 5 ng/mL. During this time frame, 202 patients received an OLT accounting for 732 hospital admissions. Preliminary review of IST inpatient prescribing patterns found no observed differences in the proportion of hospital admissions with withdrawal of MMF versus TAC (6.5%, 37 of 571 versus 4.4%, 24 of 549, $P = 0.120$). Based on the preliminary results there were no observed differences in the frequency of withdrawal for MMF versus TAC; however, several hospital admissions are still under review.

Incidence of Gram- Positive Pathogens in the Early Versus Late Period After Orthotopic Liver Transplant

Tram Vo

Research Mentor: Dr. Joshua Swan

A pre-study trial found that orthotopic liver transplantation (OLT) recipients are more susceptible to gram-positive infection in the early period in compare to the late period. It was hypothesized that the proportion of cultures that were gram positive would be higher during the early (0 to 30 days) period compared with the late (30 days to 180 days) period after OLT. A retrospective chart review was conducted which included all patients who received OLT at The Methodist Hospital from January 1, 2010 to Dec 31, 2011. All inpatient positive cultured pathogens were collected for up to 6 months after transplant. There were 119 positive cultures in the early period and 81 in the late period. There was no difference in the proportion of cultured pathogens that were gram-positive bacteria for the early period versus the late period (48%, 57 of 119 versus 54%, 44 of 81, $P = 0.373$). There were more fungal infections in the early period compared to the late period (11%, 13 of 119 vs. 0%, 0 of 81, $P < 0.001$). The rate of gram-positive pathogen found in the early period is the same as that found in the late period after OLT.

On the Dynamics of Asymmetric Tent Maps

Andrea Braddy

Research Mentor: Dr. Willie Taylor

Consider the function $J: [0, 1] \rightarrow [0, 1]$ defined by

$$J(x) = \begin{cases} 3x, & 0 \leq x \leq \frac{1}{3} \\ \frac{3}{2}(1-x), & \frac{1}{3} \leq x \leq 1 \end{cases}$$

The graph of J is an asymmetric tent. Associated with J is a family of asymmetric tent maps J_α defined by $J_\alpha(x) = \alpha J(x)$ where $0 < \alpha < 1$. The objective of this research are to determine when period-1, period-2, and period-3 points exist for J_α , to determine formulas for period-1, period-2, period-3 for J_α , and to investigate the graphs of J_α and its iterates for certain values of α between 0 and 1.

Incidence of Adverse Event from Chlorhexidine Bathing in the Surgical Intensive Care Unit: Preliminary Result from a Prospective Randomized Control Trial

Lan Bui

Research Mentor: Joshua Swan

As many as 20% of patients in the United States developed a nosocomial infection while in the Intensive Care Unit (ICU). In an effort to lower the rate of these infections, chlorhexidine gluconate (CHG) solution has been studied as an effective method of skin decontamination. Reported adverse effects of CHG are skin erythema, roughness, dryness, sensitization and allergic reaction.² However, a low occurrence of adverse event with chlorhexidine bathing has been reported in previous trials of critically ill patients.^{1,3-5} The objective of this study is to compare the incidence of medication adverse events with 2% CHG bathing every 48 hours versus standard bathing methods. A prospective randomized control trial comparing 2% CHG bathing with standard bathing methods was conducted in the surgical ICU at The Methodist Hospital. Adult non-pregnant patients with no active skin irritation or known CHG allergy were enrolled. The incidence of skin adverse events (TMH). After 2 weeks of enrollment, 11 patients in the 2% CHG arm and 9 patients in the standard bathing arm were recorded and compared between groups. randomized to the 2% CHG arm and 9 patients to standard bathing with similar baseline demographics between groups regarding age (years, 66 \pm 13 vs. 60 \pm 20), male gender (36% vs. 44%), and APACHE II (score, 17 \pm 6 vs. 15 \pm 11). vs. 0% There was no observed difference in the rates of adverse events between 2% CHG versus standard bathing (0% vs. 0%). Preliminary results found no adverse events with 2% CHG bathing.

Preliminary Results of a Randomized Controlled Trial Comparing the Incidence of Nosocomial Infections with Chlorhexidine Bathing in the Surgical Intensive Care Unit

Nourhane Badawi

Research Mentor: Joshua Swan

Nearly 20% of patients admitted to the Intensive care unit (ICU) are highly susceptible to infections caused by bacteria which enter the body via catheters and other central-line sites, surgical wounds, and mechanical ventilation, resulting in blood stream infections (BSIs), urinary tract infections (UTIs), surgical site infections (SSIs), and ventilator-associated-pneumonia (VAP).¹⁻⁶ Nearly 20% of patients admitted to the ICU will develop a nosocomial infection.²⁻⁶ In addition to increasing length of hospital stay and cost of care, these infections may enter the bloodstream, resulting in high morbidity and mortality. The use of chlorhexidine gluconate (CHG) has been studied as a method of controlling infectious outbreaks.¹⁻⁶ Chlorhexidine prevents skin colonization of pathogens; therefore, reducing horizontal transmission between patients and clinicians. The objective of this clinical trial is to determine the impact of CHG bathing during ICU hospitalization on the development of nosocomial infections, including BSIs, UTIs, SSIs, and VAP. Patients admitted to The Methodist Hospital's surgical ICU who were older than 18 years old, not pregnant, and had no known CHG allergy were enrolled in the study. Enrolled patients were randomized into the CHG or standard bathing arm. Patients randomized to the standard arm will be bathed daily according to standard procedure. Patients randomized to the CHG arm will be bathed with 2% CHG every 48 hours and with standard baths in between intervals. Infectious outcome regards to BSIs, UTIs, SSIs and VAP were recorded and compared between arms. Within the first 2 weeks of enrollment, 11 patients in the 2% CHG arm and 9 patients in the standard bathing arm were recorded. Similar baseline demographic characteristics were shared between 2% CHG group and Standard bathing group regarding age (years, 66 \pm 13 vs. 60 \pm 20), male gender (36% vs. 44%), and APACHE II (score, 17 \pm 6 vs. 15 \pm 11). There were no nosocomial infections observed in either arm (0% vs. 0%). Although recent studies show that CHG bathing significantly reduces nosocomial infections in ICU patients, there are too few patients in these preliminary results to know if there really is a treatment effect with CHG.

Oral Suspensions for Lansoprazole and Tacrolimus

Osita Okafor

Research Mentor: Dr. Rodney Hunter

Lansoprazole and tacrolimus are two medications that are frequently compounded in the hospital. The ultimate goal is to develop commercially available liquid formulations of both medications. These suspensions are extemporaneously compounded as needed and we want them to be mass produced. Tacrolimus is a widely used immunosuppressive agent for the prevention and treatment of solid organ transplant rejection. Lansoprazole is a proton-pump inhibitor that inhibits basal and stimulated gastric acid secretion. Proton-pump inhibitors are available as delayed-release capsules that contain enteric-coated granules, protecting the compounds from acid degradation. The methods in thought were high-performance liquid chromatography (HPLC) analysis, data analysis, dissolution test, pharmacoeconomic analysis and test for bacterial contamination using solid media. The capsule formulation for tacrolimus is not appropriate for pediatric patients who are often unable to swallow the capsules and adult patients with swallowing difficulties. Tacrolimus is normally dosed twice daily, thus capsule dosing would not be adequate for maintaining stable therapeutic levels at lower daily doses without wide fluctuations in concentration levels. The need for lower therapeutic serum levels and a suitable dosage form for organ transplant rejection is a compelling reason for developing an oral suspension. For lansoprazole, patient populations, such as elderly, pediatric, or critically ill patients, are unable to swallow solid dosage forms, yet require treatment with a proton-pump inhibitor. Administration of lansoprazole suspended in sodium bicarbonate solution decreases gastrointestinal bleeding following oral administration and eliminates the problem for patients that cannot swallow capsules.

The Effect of Chronic Modulation of Protein Kinase A by Dibutyryl cAMP on Gene/Protein Expression in Rat Cortical Astrocytes

Jerrad Paul Logue

Research Mentor: Amruthesh C. Shivachar

A metabolically stable analog of cAMP, dibutyryl cAMP (bucladenosine), has been recently shown to be a potent anti-inflammatory agent. However the cellular mechanisms of its action remain unclear. The purpose of this study was to determine whether chronic treatment with dibutyryl cyclic-AMP (DBC) modulates the expression of genes/proteins that affect brain astroglial structure and function. Chronic treatment with DBC has previously been shown to induce a morphological change in cultured rat cortical astrocytes. It has also been shown that DBC causes an increase in the expression of glutamate transporter 1 (GLT1), but no studies have evaluated whether DBC will induce or suppress the anti-inflammatory cannabinoid receptor subtype -2 (CB2R), in astrocytes. Frozen rat cortical astrocytes were thawed, subcultured and treated with DBC for 11 days in vitro. Qualitative measures of GLT1, glutamate aspartate transporter (GLAST), CB2R, β -integrin marker of microglia (CD11B), and glial fibrillary acidic protein (GFAP) expressions were evaluated by Immunocytochemistry and confirmed by quantitative western blotting analysis. The results showed that the DBC-treated rat cortical astrocytes underwent a morphological change, increased expression of CB2R, and showed little or no change in the expression of GLT1 or GLAST. These results suggest that the cellular mechanisms of actions of dibutyryl cyclic AMP may involve induction of anti-inflammatory genes/proteins, including CB2R, via chronic stimulation and activation of the protein kinase A mediated anti-inflammatory pathways.

DNA Accumulation in the Mouse Heart Genome

Chastity Greene

Research Mentor: Dr. Hector Miranda, Jr.

To determine whether the rate and type of mutation is time-dependent or dosage dependent, I sequenced the whole mice heart mitochondrial genome from two individuals irradiated with 6.0 Gy proton and sacrificed after 4 hrs. I then compared the types and location of mutations across the mitogenome with mice irradiated with 2 Gy proton but were sacrificed after a longer time which is 24 hr. In one 6 Gy individual, two A (adenine) were added to the heteroplasmic polyA region r of tRNA-Arginine (position 09821-09830), making that mitogenome longer by 2 bp for a total 16,301 bp instead of the usual 16,299 bp. All three mice that were proton-irradiated at 2.0 Gy showed mutations; mice #1 showed transition substitution (G to A), and two other mice both with transversions (T to A, and G to A). All point mutations observed in 2.0 Gy-irradiated mice were heteroplasmic and involved nonsynonymous substitutions. The gene regions with mutations were ND2, COXIII, Cytb and COX I. All observed mutations for 2.0 Gy were expected to be deleterious. Data from this comparative study suggest that mutations accumulation is time-dependent, rather than dosage dependent. We are currently sequencing more 2.0 Gy individuals that were sacrificed after 4 hrs, and 8 hrs to see the linear correlation between time and mutation accumulation.

The Effect of Chronic Treatment With Synthetic Cannabinoid analog, WIN 55212-2, on Gene/Protein Expressions in Rat Cortical Astrocytes

Kruti Shah

Research Mentor: Dr. Amruthesh C. Shivachar

WIN 55212-2, a potent aminoalkylindole cannabinoid receptor agonist, is known to activate p42 and p44 MAP kinase pathway and prevents inflammation caused by microglial activation and beta amyloid protein accumulation in Alzheimer's disease. The purpose of this study was to investigate the effect of WIN 55212-2 on various gene/proteins expression, particularly Glutamate transporters (GLT1 and GLAST) and the anti-inflammatory cannabinoid receptor subtype-2 (CB2R) in cultured rat cortical astrocytes. Cultures of astrocytes were exposed to 1µM WIN 55212-2 and then measured the expression of GLT1, GLAST and CB2R by immunocytochemistry and western blotting analyses. These analyses were carried out by probing the proteins with their corresponding antibodies and then examining their expression. Immunocytochemical analysis showed an increase in the expressions of GLT1 and CB2R, which were colocalized with the astroglial marker, glial fibrillary acidic protein (GFAP) in astrocytes. However, GLAST protein expressions remained unaffected. Quantitative western blot was carried out to confirm the results obtained by Immunocytochemistry analysis. Western Blot analysis revealed an up-regulation of proteins at molecular mass ~65kDa and ~37kDa, corresponding to GLT1 and CB2R, respectively. Comparison with α -actin, revealed that the expressions of GLT1 and CB2R proteins increased by 1.5 and 1.3 fold respectively. These results suggest that chronic exposure to WIN55212-2 caused an up-regulation of astroglial GLT1 and CB2 receptors, the latter would eventually prevent inflammatory responses in the brain without inducing the cannabinoid-mediated psychotic responses.

Effect of PPAR γ Deletion in Renal Epithelium on Kidney Function

Ahouti Avi

Research Mentors: Dr. Weiman He and Dr. Adebayo Oyekan

PPAR γ is a nuclear hormonal receptor that plays an important role in regulating lipid and glucose homeostasis. It also serves as the target of anti-diabetic drugs thiazolidinediones (TZDs). Previous studies have revealed pleiotropic effects of this receptor in different organs and tissues. To determine whether PPAR γ controls normal kidney function, we examined salt and water metabolism in the kidneys in renal epithelial cell-specific PPAR γ knockout mice in physiological condition. Our studies showed that knockout mice had increased amounts of urine and sodium excretion compared to the control mice (the average water intake of male knockout mice was 0.24 ml/g \pm 0.05 ($p=0.085519$) and mean urine output of 0.07 ml/g \pm 0.03 ($p=0.168922$). On the other hand, the control mice had an average water intake of 0.16 ml/g \pm 0.08 and mean urine output of 0.057 ml/g \pm 0.016. In females, knockout mice averaged a water intake of 0.25 ml/g \pm 0.05 ($p=0.05$) and a urine output of 0.072 \pm 0.019 ($p=0.098663$) whereas the controls had an average water intake of 0.16 \pm 0.08 and an urine output of 0.056 \pm 0.016. The sodium excretion averaged 90.82 mmol/24 h \pm 53.37 ($p=0.112899$) for knockout mice and 67.79 mmol/24 h \pm 29.92 for the control mice respectively. In addition, we observed the hydronephrotic phenotype in knockout mice. In determining protein levels of PPAR γ in kidney in control and knockout mice using Western analyses, we failed to show detectable levels of this receptor while its family member PPAR α is highly expressed. Interestingly, ischemia-reperfusion results in downregulation of PPAR α in the kidney. In conclusion, PPAR plays an important role in regulating normal function of the kidneys in controlling salt and water metabolism.

Port of Houston: A Development Strategy for Recreation Business Development and Resource Utilization

Damon Hall

Research Mentor: Dr. Maria Burns

The absence of attractions at the Port of Houston is not sufficient for the passengers at the Cruise Terminal. My project consisted of analysis of data that was known and trying to come up with solutions to problems that are unknown. My main comparison was with our neighbor port. The Port of Galveston which has beautiful attractions of all kind. When comparing the two I notice the beauty of the Port of Galveston. Port of Galveston has a significant amount of cruise terminal passengers. The attractions that they offer can be utilized by all age groups and economic backgrounds. When visiting the port of Houston I notice there is really no excitement. Business was the only thing that was noticed at the port. With the addition of attractions the port wouldn't look so dull. Also with the attraction addition the city unemployment rate will decrease. To come up with my ideas on upgrading the cruise terminal I used multiple resources. The POHA had lots of resourceful information. I looked up attractions at ports around the world. When looking at how beautiful other ports are and their sources that surround them, Houston should be second to none. There is potential at the Port for the addition of attractions to be a success. The economy in the city is in good standing. During the research I and my mentor had discussions on statistical information. A lot of information that was attained we analyzed. The attractions from around the country's ports expanding my ideas. For example, the design of the Fontainebleau can be used, when making a blueprint for a hotel at the port. The type of research I used is called Methodology. Methodology is the analysis of information and the use of methods in the process of formation. For example, the design of the Fontainebleau can be used, when making the blueprint for an attraction to the port. Professor Burns communicated very well. Updated information was constantly given to me. In the process of analyzing and data collection the development of attractions and economic growth for the Port of Houston

The Growth Response of *Saccharomyces Cerevisiae* to Constant Temperature Increase

Sarah Glenn

Research Mentor: Dr. Ayodotun Sodipe

Microorganisms that are found everywhere in the world encounter a constantly changing environment, and need to be able to adapt to potentially threatening conditions to survive. The ability to sense and respond to conditions such as increasing temperatures is significant for growth and existence. This study has been conducted in order to evaluate the biological and molecular responses of the brewery yeast, *Saccharomyces cerevisiae* in stressful heat conditions. Consequently providing educated insight on the most highly studied fungi used in understanding more advanced organisms. This research focuses on measuring of the energetics of the stress response. The exponentially growing cells of *saccharomyces cerevisiae* strain X2180-1A had a sequence of heat stresses applied, starting from 30°C to 38° through 43°. In respect to growth and temperature, a fine line was observed for the exponentially growing cells between developing, surviving and dying. The transition from growth to non-growth was so abrupt, it suggests that rapid denaturation of one or more limited number of enzymes present in a culture is important to cell growth. Catabolic and anabolic rates were presented as well as the sustainability and cell growth. The examined heat stress sequence demonstrated that the yield of glucose decreased with increasing temperature. In addition, immediately after the increase in temperature a peak formed followed by a new steady level of growth until the growth temperature increased to its max of 43°C. This indicates that heat stress that is non-lethal redistributes catabolic and anabolic fluxes and that life at elevated temperatures for this microorganism is unfavourable.

